



The Commonwealth of Massachusetts

Executive Office of Health and Human Services

Department of Public Health

Bureau of Environmental Health

Radiation Control Program

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***DENTAL * OR *MEDICAL ***

SHIELDING AND REGISTRATION REQUIREMENTS FOR NEW FACILITIES OR FACILITIES THAT ARE PLANNING MODIFICATION

Registration of x-ray units in the Commonwealth of Massachusetts is mandatory. Each person who owns or possesses and administratively controls a radiation machine facility shall apply for registration with the Radiation Control Program. The facility shall possess a valid Certificate of Registration prior to operation of a radiation machine facility.

If the facility is new, follow this procedure:

1. Prior to construction, a shielding plan shall be submitted to the Radiation Control Program for review and approval. The plan shall meet the requirements of Appendices "A", and "C" unless an exemption is specifically requested. These appendices are included in this packet.
2. An application for registration is included in this packet. **The shielding design will not be reviewed unless the application for registration is submitted with the shielding design. Likewise, an application for registration of a new facility will not be processed unless a shielding design is submitted.** After the application for registration is reviewed by the Radiation Control Program and assigned a number, an invoice will be sent to the facility. A Certificate of Registration will be issued to the facility by the Radiation Control Program upon payment of the required fee. Each facility shall possess a valid Certificate of Registration **prior** to operation of such facility.

IF THE FACILITY IS CURRENTLY REGISTERED WITH THE RADIATION CONTROL PROGRAM AND IS PLANNING A MODIFICATION, FOLLOW THE PROCEDURE:

1. **Prior** to construction, a shielding plan shall be submitted to the Radiation Control Program for review and approval. The plan shall meet the requirements of Appendices

"A", and "C" unless an exemption is specifically requested. These Appendices are included in the packet.

2. An application for registration is included in this packet. Return the completed application with the shielding design. The shielding plan will not be reviewed unless the application for registration is returned with the shielding design. It is **imperative** that you put your radiation control number on the right top corner of the application, and put your RCN on your submitted shielding design. Your radiation control number can be found on your Certificate of Registration. The application shall include all the current information about your facility. Inclusion of your radiation control number will prevent your facility from being registered as a new facility.

The Radiation Control Program encourages persons to submit their own shielding designs. However, the services of a qualified expert may be utilized. Lists of Health Physics, Installation, and Shielding Design consultants are on our website if you would like to contract for their services.

Good reference sources for shielding plans are:

- 1) NCRP Report No: 49, "Structural Shielding Design and Evaluation for Medical Use of Xrays and Gamma Rays of Energies up to 10 MEV"
NCRP Publications
7910 Woodmont Ave., Suite 1016
Bethesda, MD 20814
- 2) 105 CMR 120.00 Rules and Regulations to Control the Radiation Hazards of Radioactive Materials and of Machines Which Emit Ionizing Radiation. Copies of the regulations may be obtained by contacting:

State Book Store
State House, Room 116
Boston, MA 02133
Telephone Number (617) 727-2834

If you have any questions regarding the shielding and registration requirements please contact Karen Farris or the Officer of the Day at the Radiation Control Program, telephone number (617) 242-3035.

105 CMR 120.420: Appendix A
Radiation Shielding and Safety Requirements

In order for the Radiation Control Program to provide an evaluation, and official approval on shielding requirements for a radiation installation, the following must be submitted. The plans shall show as a minimum the following:

- (A) The normal location of the x-ray system's radiation port, the port's travel and transverse limits, general direction(s) of the useful beam; locations of any windows and doors; the location of the operator's booth and the location of the x-ray control panel.
- (B) The structural composition and thickness or lead equivalent of all walls, doors, partitions, floor and ceiling of the room(s) concerned.
- (C) The dimensions of the room(s) concerned.
- (D) The type of occupancy of all adjacent areas inclusive of space above and, below the room(s) concerned. If there is any exterior wall, show distance to the closest area(s) where it is likely that individuals will be present.
- (E) The make and model of the x-ray equipment.
- (F) The typical type of examination(s) and treatment(s) which will be performed with the equipment.
- (G) Information on the anticipated workload of the x-ray system(s).
- (H) An interlock and/or warning light shall be installed at all egresses. For diagnostic x-ray installations, the warning light shall be wired to the rotor of the x-ray system.
- (I) All basic assumptions used to determine the shielding requirements in developing these plans shall be submitted with these plans.

105 CMR 120.422: Appendix C
Design Requirements for an Operator's Booth

(A) Space Requirements

- (1) The operator shall be allotted not less than 7.5 square feet (0.697 m^2) of unobstructed floor space in the booth...
- (2) The operator's booth may be any geometric configuration with no dimension of less than two feet (0.61 m).
- (3) The space shall be allotted excluding any encumbrance by the x-ray control panel, such as overhang, cables or other similar encroachments.
- (4) The booth shall be located or constructed such that unattenuated direct scatter radiation originating in the examination table or at the wall cassette shall not reach the operator's station in the booth.

(B) Structural Requirements

- (1) The booth walls shall be permanently fixed barriers of at least seven feet (2.13 m) high.
- (2) When a door or movable panel is used as an integral part of the booth structure, it must have an interlock which will prevent an exposure when the door or panel is not closed.
- (3) Shielding shall be provided to maintain exposure inside the booth equal to or less than two mR per week.

(C) X-Ray Control Placement. The x-ray exposure switch for the system shall be fixed within the booth and;

- (1) Shall be at least 40 inches (1.02 m) from any open edge of the booth and;
- (2) Shall allow the operator to use the majority of the available viewing windows.

(D) Viewing System Requirements.

- (1) Each booth shall have at least one viewing device which will:
 - (a) Be so placed that the operator can view the patient during any exposure; and,
 - (b) The device should be so placed that the operator can have full view of any occupant of the room and should be so placed that the operator can view any entry into the room. If any door that allows access to the room cannot be seen from the booth, then that door must have an interlock controlling the exposure, which will prevent the exposure if the door is not closed.
- (2) When the viewing system is a window, the following requirements also apply:
 - (a) The viewing area shall be at least one square foot (0.0929 m^2).

- (b) The design of the booth shall be such that the operator's expected position when viewing the patient and operating the x-ray system is at least 18 inches (0.457m) from the edge of the booth.
 - (c) The material constituting the window shall have at least the same lead equivalence as that required in the booth's walls in which it is mounted.
- (3) When the viewing system is by mirrors, the mirror(s) shall be so located as to accomplish the general requirements of 105 CMR 120.421: Appendix B section 4(A).
- (4) When the viewing system is by electronic means:
 - (a) The camera shall be so located as to accomplish the, general requirements of 105 CMR 120.421: Appendix B section 4.(A); and,
 - (b) There shall be an alternate viewing system as a backup for the primary system.
 - (c) Means shall be provided for the operator to be able to orally communicate with the patient at all times.

CURRENT REGISTRATION FEES IN
THE COMMONWEALTH OF MASSACHUSETTS
AS REQUIRED BY
THE RADIATION CONTROL PROGRAM
MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
105 CMR 120.000
THESE FEES ARE FOR YOUR INFORMATION ONLY

This chart reflects the costs for the following:

Type Of Facility	Annual Registration Fee
Dental	\$45.00 Per Tube
* Hospital	\$90.00 Per Tube
Therapy Unit	\$90.00 Per Tube
Physician's Office, Academic, Chiropractic, Veterinarian, Clinic, Podiatry, Radiology, Analytical, Other	\$75.00 Per Tube
Non-Hospital Bone Densitometer	\$75.00 Per Tube
** Accelerator	\$3,000.00 Per Unit
Ion Implantation Device	\$600.00 Per Unit

*** \$900.00 Maximum charge for Hospitals has been cancelled.**

**** \$4,000.00 If used for commercial use and produces radioactive materials.**

DO NOT SEND PAYMENT

PLEASE WAIT UNTIL YOU ARE INVOICED
BY THE RADIATION CONTROL PROGRAM

**MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
RADIATION CONTROL PROGRAM
APPLICATION FOR REGISTERING RADIATION SOURCES**

FACILITY NAME: _____

FACILITY ADDRESS: _____

CITY, STATE, ZIP: _____

PHONE NUMBER: _____

RESPONSIBLE PERSON: _____

EMAIL ADDRESS: _____

CHECK OFF TYPE OF FACILITY USING CODES LISTED BELOW:

01- CHIROPRACTOR: _____

02- CLINIC: _____

03- DENTAL OFFICE: _____

**04- EDUCATIONAL
INSTITUTION:** _____

05- HOSPITAL: _____

06- PHYSICIAN: _____

07- PODIATRIST: _____

08- PORTABLE: _____

09- RADIOLOGIST: _____

10- VETERINARIAN: _____

11- OTHER: _____

HOW MANY OF THE FOLLOWING MACHINES TYPES DO YOU HAVE?

MEDICAL:

Radiography _____

Fluoro _____

Portables _____

C-Arms _____

CT _____

Bone Density _____

DENTAL:

Intraoral _____

Nomad hand held _____

Panorex _____

Pan/Ceph Combo _____

Ceph Unit _____

Cone beam CT _____

THERAPY: _____

ANALYTICAL: _____

This is a new facility: _____

This is an additional unit: _____

SIGNATURE: _____ **DATE:** _____